



KASIREDDY NARAYANREDDY COLLEGE OF ENGINEERING & RESEARCH

(Approved by AICTE & Affiliated to JNTUH)

Abdullapur (V), Abdullapurmet (M), R.R Dist, 501505, Telangana, INDIA.

Email : principal@knrcer.ac.in ; website: www.knrcer.ac.in

2.6.1 Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students.

Civil Engineering I & II Sem Course Outcomes for the Academic Year 2022-2023

Civil Engineering I&II Sem Course Outcomes for the Academic Year 2022-2023			
S.No.	Year/Sem	Course Name	Course Outcomes
1	II/I	Surveying and Geomatics	CO1: Calculate angles, distances and levels
			CO2: Identify data collection methods and prepare field notes
			CO3: Understand the working principles of survey instruments
			CO4: Estimate measurement errors and apply corrections
			CO5: Interpret survey data and compute areas and volumes
2	II/I	Engineering geology	CO1: Understand weathering process and mass movement
			CO2: Distinguish geological formations
			CO:3 Identify geological structures and process for rock mass quality
			CO:4 Identify subsurface information and groundwater potential sites through geophysical investigations
			CO:5 Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels
3	II/I	Strength of Materials-1	CO:1 Analyze the statically determinate and indeterminate problems.
			CO:2 Determine the stresses and strains in the members subjected to axial bending
			CO:3 Evaluate the slope and deflection of beams subjected to loads.
			CO:4 Determine the principal stresses and strains in structural members
			CO:5 Frame an idea to design a system, component or process
4	II/I	Probability and Statistics	CO:1 Understand concepts of discrete probability, conditional probability, independence, and be able to apply these concepts to engineering applications
			CO:2 Be able to use statistical concepts to analyse and interpret engineering data.
			CO:3 Equipping students with essential tools for statistical analyses at the graduate level
			CO:4 Providing students with a formal treatment of probability theory
			CO:5 Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data
5	II/I	Fluid Mechanics	CO1: Apply conservation laws to derive governing equations and research



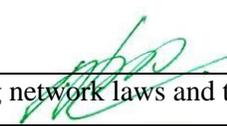
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			CO2:Compute hydrostatic and hydrodynamic forces.
			CO3:Analyze and design simple pipe systems.
			CO4:Apply principles of dimensional analysis to design experiments.
			CO5:Compute drag and lift coefficients.
6	II/I	Surveying Lab	CO1:Able to perform chain survey and plotting of closed traverse and also obstacles
			CO2:Determines distance between two inaccessible points with compass
			CO3:Perform reduced level and distances using tachometric survey
			CO4:Able to perform trigonometric leveling using theodolite for heights and distances problems.
			CO5:Determines Radiation method, intersection methods by plane table survey
7	II/I	Strength of Materials Lab	CO1:Conduct tension test on materials like steel etc.
			CO2:Conduct compression tests on spring, wood and concrete
			CO3:Conduct flexural and torsion test to determine elastic constants
			CO4:Determine hardness of metals
			CO5:Write a technical laboratory report
8	II/I	Engineering geology Lab	CO:1Understand weathering process and mass movement
			CO:2Distinguish geological formations
			CO:3Identify geological structures and process for rock mass quality
			CO:4Identify subsurface information and groundwater potential sites through geophysical investigations
			CO:5Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels
9	II/I	Constitution of India	CO:1Understand the emergence and evaluation of Indian constitution
			CO:2Understand the structure and composition of Indian constitution
			CO:3Understand and analyses federalism in the Indian context
			CO:4Analyse panchayathi Raj institutions as a medium of decentralization
			CO:5Understand and analyze the three organs of the state in the contemporary scenario
10	II/II	Basic Electrical	CO:1To analyze and solve electrical circuits using network laws and theorems.


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		and Electronics Engineering	CO:2 To understand and analyze basic electrical and magnetic circuits
			CO:3 To study the working principles of electrical machines
			CO:4 To introduce components of low voltage electrical installations
			CO:5 To identify and characterize diodes and various types of transistors
11	II/II	Basic Mechanical Engineering for Civil Engineering	CO:1 To understand the mechanical equipment for the usage at civil engineering systems.
			CO:2 To familiarize with the general principles and requirements for refrigeration, manufacturing
			CO:3 To realize the techniques employed to construct civil engineering systems
			CO:4 To understand the manufacturing process for the usage at civil engineering constructions
			CO:5 Learning the design and working process of machine tools for the usage of construction field
12	II/II	Building Materials Construction and Planning	CO:1 Define the basic terminology that is used in the industry
			CO:2 Categorize different building materials, properties and their uses
			CO:3 Understand the prevention of damage measures and good workmanship
			CO:4 Explain different building services
			CO:5 Explain different building plan services
13	II/II	Strength of Materials-II	CO:1 Describe the concepts and principles, understand the theory of elasticity, and perform calculations, relative to the strength of mechanical components in particular to torsion and direct compression;
			CO:2 To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading
			CO:3 Analyze strength and stability of structural members subjected To Direct, and Direct and Bending stresses;
			CO:4 Understand and evaluate the shear center and unsymmetrical bending.
			CO:5 Frame an idea to design a system, component or process
14	II/II	Hydraulics and Hydraulic	CO:1 Apply their knowledge of fluid mechanics in addressing problems in open channels and hydraulic machinery.

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		Machinery	CO:2 Understand and solve problems in uniform, gradually and rapidly varied flows in open channel in steady state conditions.
			CO:3 Apply dimensional analysis and to differentiate the model, prototype and similitude conditions for practical problems.
			CO:4 Get the knowledge on different hydraulic machinery devices and its principles that will be utilized in hydropower development and for other practical usages
			CO:5 Students able to know the performance of single stage and multistage pumps
15	II/II	Structural Analysis-I	CO:1 An ability to apply knowledge of mathematics, science, and engineering
			CO:2 Analyse the statically indeterminate bars and continuous beams
			CO:3 Draw strength behaviour of members for static and dynamic loading
			CO:4 Calculate the stiffness parameters in beams and pin jointed trusses.
			CO:5 Understand the indeterminacy aspects to consider for a total structural system
16	II/II	Computer aided Civil Engineering Drawing	CO:1 Use the Autocad commands for drawing 2D & 3D building drawings required for different civil engg applications.
			CO:2 Plan and draw Civil Engineering Buildings as per aspect and orientation.
			CO:3 Presenting drawings as per user requirements and preparation of technical report
17	II/II	Hydraulics and Hydraulic Machinery Lab	CO:1 Describe the basic measurements techniques of fluid mechanics and its appropriate application.
			CO:2 Interpret the results obtained in the laboratory for various experiments
			CO:3 Discover the practical working of Hydraulic machines different types of Turbines, pumps, and other miscellaneous hydraulic machines
			CO:4 Compare the results of analytical models introduced in lecture to the actual behaviour of real fluid flows and draw correct and sustainable conclusions.
			CO:5 Write a technical laboratory report
18	II/II	Basic Electrical and Electronics Engineering Lab	CO:1 To analyze and solve electrical circuits using network laws and theorems.
			CO:2 To understand and analyze basic electrical and magnetic circuits
			CO:3 To study the working principles of electrical machines
			CO:4 To introduce components of low voltage electrical installations
			CO:5 To identify and characterize diodes and various types of transistors



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19	II/II	Gender Sensitization Lab	CO:1 Students will have developed a better understanding of important issues related to gender in contemporary India.
			CO:2 Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
			CO:3 Students will acquire insight into the gendered division of labour and its relation to politics and economics.
			CO:4 Men and women students and professionals will be better equipped to work and live together as equals.
			CO:5 Students will develop a sense of appreciation of women in all walks of life
20	III/I	Structural Analysis-II	CO:1 Analyze the two hinged arches.
			CO:2 Solve statically indeterminate beams and portal frames using classical methods
			CO:3 Sketch the shear force and bending moment diagrams for indeterminate structures.
			CO:4 Formulate the stiffness matrix and analyze the beams by matrix methods
			CO:5 Analyze to know the influence lines for indeterminate structures
21	III/I	Geotechnical Engineering	CO:1 Characterize and classify the soils
			CO:2 Able to estimate seepage, stresses under various loading conditions and compaction characteristics
			CO:3 Able to analyse the compressibility of the soils
			CO:4 Able to understand the strength of soils under various drainage conditions
			CO:5 Able to know the failure mechanism and the shear strength of soils
22	III/I	Structural Engineering-I (RCC)	CO:1 Compare and design the singly reinforced, doubly reinforced and flanged sections.
			CO:2 Design the axially loaded, uniaxial and biaxial bending columns
			CO:3 Classify the footings and design the isolated square, rectangular and circular footings
			CO:4 Distinguish and design the one-way and two-way slabs.
			CO:5 Students able to know the design of footings for different foundations
23	III/I	Transportation Engineering	CO:1 An ability to apply the knowledge of mathematics, science and engineering in the areas of traffic engineering, highway development and maintenance

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			CO:2 An ability to design, conduct experiments to assess the suitability of the highway materials like soil, bitumen, aggregates and a variety of bituminous mixtures. Also the students will develop the ability to interpret the results and assess the suitability of these materials for construction of highways.
			CO:3 Ability to design flexible and rigid highway pavements for varying traffic compositions as well as soil subgrade and environmental conditions using standards stipulated by Indian Roads Congress.
			CO:4 An ability to evaluate the structural and functional conditions of in-service highway pavements and provide solution in the form of routine maintenance measures or designed overlays using Indian Roads congress guidelines.
			CO:5 An ability to assess the issue related to road traffic and provide engineering solutions supported with an understanding of road user psychological and behavioural patterns.
24	III/I	Concrete Technology	CO:1 Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests.
			CO:2 Recognize the effects of rheology and early age properties of concrete on its long term behaviour.
			CO:3 Apply the use of various chemical admixtures and mineral additives to design cement-based materials with tailor-made properties
			CO:4 Use advanced laboratory techniques to characterize cement-based materials.
			CO:5 Perform mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, and fibre reinforced concrete.
25	III/I	Engineering Economics and Accountancy	CO:1 To perform and evaluate present and future worth of the alternate projects and to appraise projects by using traditional and DCF methods.
			CO:2 To carry out cost benefit analysis of projects and to calculate BEP of different alternative projects.
26	III/I	Highway Engineering and Concrete Technology Lab	CO:1 Categorize the test on materials used Civil Engineering Buildings & Pavement constructions
			CO:2 To perform the tests on concrete for its characterization

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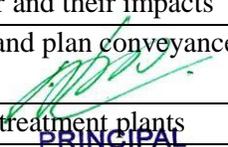
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			CO:3To design concrete mix proportioning by using Indian standard method
			CO:4Examine the tests performed for bitumen mixes
			CO:5To prepare a laboratory report
27	III/I	Geotechnical Engineering Lab	CO:1At the end of the course, the students will be able to classify and evaluate the behaviour of the soils subjected to various loads.
28	III/I	Advanced Communication Skills Lab	CO:1The students will able to use english language both written and spoken
			CO:2The students will able to enrich their comprehension ability and fluency
			CO:3To understand the concept and will gain confidence level in the appearing in the jam, debate role-play
			CO:4The students will able to develop the study skills and communication skills in formal and informal situations
			CO:5The students will able to improve the language proficiency in English with writing skills also
29	III/I	Intellectual Property Rights	CO:1Intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.
			CO:2Purpose and function of trademarks, acquisition of trade mark rights
			CO:3Foundation of patent law, patent searching process, ownership rights and transfer
			CO:4New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits
30	III/II	Hydrology and Water Resource Engineering	CO:1Understand the different concepts and terms used in engineering hydrology
			CO:2To identify and explain various formulae used in estimation of surface and ground water hydrology components
			CO:3Demonstrate their knowledge to connect hydrology to the field requirement
			CO:4The students will able to know the to increase the ground water table depends upon claimnatic factors
			CO:5To understand and the importance of canal regulation system in irrigation
31	III/II	Environmental Engineering	CO:1Assess characteristics of water and wastewater and their impacts
			CO:2Estimate quantities of water and wastewater and plan conveyance components
			CO:3Design components of water and waste water treatment plants


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			CO:4 Be conversant with issues of air pollution and control
			CO:5 To understand the concept of various unit operations and design of water treatment systems
32	III/II	Foundation Engineering	CO:1 Understands the principles and methods of Geotechnical Exploration
			CO:2 Decide the suitability of soils and check the stability of slopes
			CO:3 Calculate lateral earth pressures and check the stability of retaining walls
			CO:4 Analyse and design the shallow and deep foundations
			CO:5 Student will be able to analyse and design of well foundations
33	III/II	Structural Engineering-II (Steel)	CO:1 Analyze the tension members, compression members.
			CO:2 Design the tension members, compression members and column bases and joints and connections
			CO:3 Analyze and design the beams including built-up sections and beam and connections.
			CO:4 Identify and Design the various components of welded plate girder including stiffeners
			CO:5 Analyse and design of roof trusses
34	III/II	Prestressed Concrete	CO:1 Acquire the knowledge of evolution of process of prestressing
			CO:2 Acquire the knowledge of various prestressing techniques
			CO:3 Develop skills in analysis design of prestressed structural elements as per the IS code provisions
			CO:4 To develop transformation of stresses in pretensioned members
			CO:5 Students will be able to know the composite beams and deflections
35	III/II	Environmental Engineering Lab	CO:1 Understand about the equipment used to conduct the test procedures
			CO:2 Perform the experiments in the lab
			CO:3 Examine and Estimate water, air and soil Quality
			CO:4 Compare the water, air quality standards with prescribed standards set by the local governments
			CO:5 Develop a report on the quality aspect of the environment
36	III/II	Computer Aided Design Lab	CO:1 Model the geometry of real-world structure represent the physical model of structural element /structure
			CO:2 Perform analysis
			CO:3 Design the structural elements and a system as per IS Codes



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			CO:4 Interpret from the post processing results
37	III/II	Environmental Science	CO:1 Get the knowledge about the different types of resources like land, water, mineral and energy and also about the effects of environments by the usage of these resources
			CO:2 Get the information about ecosystem and also about its functions like food chain Ecological pyramids etc
			CO:3 Gain the knowledge about the ecosystem diversity its values and also about the importance of the endemic species and different techniques involved in its conservation
			CO:4 Gain the knowledge about the different types of pollutions and their control technologies, Waste water treatment , Bio medical waste management etc
			CO:5 Get the complete information about EIA-Environmental Impact Assessment , Sustainable developmental activities , environmental policies and regulations awareness among people
38	III/II	Advanced Structural Analysis	CO:1 Analyze the multistory building frames by various approximate methods
			CO:2 Solve the continuous beams portal frames by matrix methods of analysis
			CO:3 Analyze and design of large frames with or without shear walls
			CO:4 Analyze and design plane truss continuous beams
			CO:5 \students will able to know the structural behaviour of large frames
39	IV/I	Transportation Engineering-II	CO:1 Understand Plan highway networks
			CO:2 Design highway geometrics
			CO:3 Design Intersections and prepare traffic management plans.
			CO:4 Design flexible and rigid pavements
			CO:5 An ability to assess the issue related to road traffic and provide engineering solutions supported with an understanding of road user psychological and behavioural patterns.
40	IV/I	Estimation Quantity Surveying and Valuation	CO:1 Understand the technical specifications for various works to be performed for a project
			CO:2 Quantify the worth of a structure by evaluating the quantities of constituents , derive their cost rates
			CO:3 Understand how competitive bidding works and how to submit a bidding proposal

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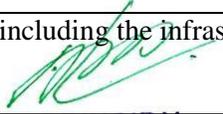
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			CO:4An idea of how to optimize construction projects based on costs
			CO:5An ability to put forward ideas and understandings to others with effective communication processes
41	IV/I	Ground Improvement Techniques	CO 1 Identify the purpose of ground improvement techniques to obtain the suitable construction site for long-lasting structures.
			CO 2 List the problematic soils and its characteristics to select the suitable method for ground improvement.
			CO 3 Illustrate the various methods of ground improvement techniques to increase load bearing capacity of beneath and surface soils
			CO 4 Apply the methods of physical, chemical, mechanical and hydraulic for obtaining void less soils
			CO 5 Explain the various grouting techniques and its applications for improving loadbearing of beneath soils
42	IV/I	Traffic Engineering	CO:1Understand basics principal of Traffic Engineering
			CO:2Analyze parking data and model accidents
			CO:3Determine capacity and LOS.
			CO:4To provide engineering techniques to achieve safe and efficient movement of people and goods on roadways
			CO:5Students will able to know deal with traffic issues including safety planning design operation and control
43	IV/I	Utilization of Electrical Energy	CO:1Able to maintain electric drives used in an industries
			CO:2Able to identify a heating/ welding scheme for a given application
			CO:3Able to maintain/ Trouble shoot various lamps and fittings in use
			CO:4Able to figure-out the different schemes of traction schemes and its main components
			CO:5Able to design a suitable scheme of speed control for the traction systems
			CO:6Able to identify the job/higher education / research opportunities in Electric Utilization industry
44	IV/I	Airports, Railways and Waterways	CO:1At the end of this course, the students will develop:
			CO:2An ability to design of runways and taxiways.
			CO:3An ability to design the infrastructure for large and small airports
			CO:4An ability to design various crossings and signals in Railway Projects.
			CO:5An ability plan the harbors and ports projects including the infrastructure required for new ports and harbors.


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45	IV/I	Non- Conventional Energy Sources	CO:1 Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells.
			CO:2 Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation.
			CO:3 Explore the concepts involved in wind energy conversion system by studying its components, types and performance
			CO:4 Illustrate ocean energy and explain the operational methods of their utilization
			CO:5 Acquire the knowledge on Geothermal energy.
46	IV/I	Ground Water Hydrology	CO:1 Various components of hydrologic cycle that affect the movement of water in the earth
			CO:2 Various Stream flow measurements technique
			CO:3 the concepts of movement of ground water beneath the earth
			CO:4 the basic requirements of irrigation and various irrigation techniques, requirements of the crops
			CO:5 Distribution systems for canal irrigation and the basics of design of unlined and lined irrigation canals design CO- 6 Basic components of river Training works.
47	IV/I	Transportation Engineering Lab	CO:1 At the end of the course, the students will be able to Assess for Highway construction properties of highway materials
48	IV/I	Environmental Engineering Lab	CO:1 The students will develop the knowledge in mathematics science and engineering
			CO:2 The students will be able to design and conduct experiments interpret and analyze data and report results
			CO:3 The students will demonstrate the ability to design of civil Engineering systems or a process that meets desired specifications and requirements related to all fields of civil Engineering
			CO:4 The students will demonstrate the ability to function on engineering and science laboratory teams, as well as on multidisciplinary design teams
			CO:5 The students will demonstrate the ability to identify, formulate and solve Civil engineering problems
49	IV/I	Industry Oriented Mini Project	CO:1 Formulate a real world problem and develop its requirements
			CO:2 Ability to plan and execute well defined objective
			CO:3 Ability to work in team at component level
			CO:4 Ability to solve problems on analysis & design


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			CO:5 Self learn new softwares and /or techniques that contribute to the software solution of the project
50	IV/I	Seminar	CO:1 The students will be able to recall existing technologies in the area of Designing
			CO:2 The students will be able to describe compare and evaluate different technologies
			CO:3 The students will be able to decide the area of interest
			CO:4 The students will demonstrate the ability to identify, formulate and solve Civil engineering problems
			CO:5 The students will be able to write technical reports
51	IV/II	Solid Waste Management	CO:1 Identify the physical and chemical composition of wastes
			CO:2 Analyze the functional elements for solid waste management
			CO:3 Analyze the functional elements for liquid waste management
			CO:4 To understand the effluent treatment Plants and its disposal
			CO:5 Plan measures for reclamation of saline soils
52	IV/II	Industrial Waste Water Treatment	CO:1 Identify the characteristics of industrial wastewaters
			CO:2 Describe pollution effects of disposal of industrial effluents
			CO:3 Identify and design treatment options for industrial wastewater
			CO:4 Formulate environmental management plan
			CO:5 Suggest methods for safe disposal of hazardous wastes
53	IV/II	Pavement Design	CO:1 Characterize the response characteristics of soil, aggregate, asphalt mixes
			CO:2 Analyze flexible pavements
			CO:3 Analyze rigid pavements
			CO:4 Design a flexible pavement using IRC, Asphalt Institute and AASHTO methods
			CO:5 Design a rigid pavement using IRC, and AASHTO methods
54	IV/II	Major Project	CO:1 Student will be able to work in a group as a part of multidisciplinary team with professional responsibility
			CO:2 Student will be able to Analyse and design of structure to meet desired needs with in realistic constraints
			CO:3 Student is capable of doing Review literature and finalizes problem statement
			CO:4 Student can plan activity schedule and implementation in a given time span
			CO:5 Student will be able to prepare and present technical report

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Electrical & Electronics Engineering I & II Sem Course outcomes for the Academic year 2022-2023

S.NO.	YEAR/ SEM	COURSE NAME	Course Outcomes
1	II/I	Engineering Mechanics	CO1: Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.
			CO2: Solve problem of bodies subjected to friction.
			CO3: Find the location of centroid and calculate moment of inertia of a given section.
			CO4: Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
			CO5: Solve problems using work energy equations for translation, fixed axis rotation and planar motion and solve problems of vibration.
2	II/I	Electrical Circuit Analysis	CO1: Apply network theorems for the analysis of electrical circuits.
			CO2: Obtain the transient and steady-state response of electrical circuits.
			CO3: Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
			CO4: Analyze two port circuit behavior.
3	II/I	Analog Electronics	CO1: Know the characteristics, utilization of various components.
			CO2: Understand the biasing techniques
			CO3: Design and analyze various rectifiers, small signal amplifier circuits.
			CO4: Design sinusoidal and non-sinusoidal oscillators.
			CO5: A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits



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4	II/I	Electrical Machines - I	CO1: Identify different parts of a DC machine & understand its operation
			CO2: Carry out different testing methods to predetermine the efficiency of DC machines
			CO3: Understand different excitation and starting methods of DC machines
			CO4: Control the voltage and speed of a DC machines
			CO5: Analyze single phase and three phase transformers circuits.
5	II/I	Electromagnetic Fields	CO1: To understand the basic laws of electromagnetism.
			CO2: To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3: To analyze time varying electric and magnetic fields.
			CO4: To understand Maxwell's equation in different forms and different media.
			CO5: To understand the propagation of EM waves.
6	II/I	Electrical Machines Lab -I	CO1: Start and control the Different DC Machines
			CO2: Assess the performance of different machines using different testing methods
			CO3: Identify different conditions required to be satisfied for self - excitation of DC Generators.
			CO4: Separate iron losses of DC machines into different components
7	II/I	Analog Electronics Lab	CO1: Know the characteristics, utilization of various components.
			CO2: Understand the biasing techniques
			CO3: Design and analyze various rectifiers, small signal amplifier circuits
			CO4: Design sinusoidal and non-sinusoidal oscillators.



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			CO5: A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.
8	II/II	Laplace Transforms, Numerical Methods And Complex Variables	CO1: Use the Laplace transforms techniques for solving ODE's
			CO2: Find the root of a given equation.
			CO3: Estimate the value for the given data using interpolation
			CO4: Find the numerical solutions for a given ODE's
			CO5: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
			CO6: Taylor's and Laurent's series expansions of complex function
9	II/II	Electrical Machines – Ii	CO1: Understand the concepts of rotating magnetic fields.
			CO2: Understand the operation of ac machines
			CO3: Analyze performance characteristics of ac machines.
10	II/II	Digital Electronics	CO1: Understand working of logic families and logic gates.
			CO2: Design and implement Combinational and Sequential logic circuits.
			CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion.
			CO4: Be able to use PLDs to implement the given logical problem.
11	II/II	Control Systems	CO1: Understand the modeling of linear-time-invariant systems using transfer function and state-space representations
			CO2: Understand the concept of stability and its assessment for linear-time invariant systems
			CO3: Design simple feedback controllers.
	II/II	Power System-I	CO1: Understand the concepts of power systems
			CO2: Understand the operation of conventional generating stations and renewable sources of electrical power.
			CO3: Evaluate the power tariff methods

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12			CO4: Determine the electrical circuit parameters of transmission lines
			CO5: Understand the layout of substation and underground cables and corona.
13	II/II	Digital Electronics Lab	CO1: Understand working of logic families and logic gates.
			CO2: Design and implement Combinational and Sequential logic circuits.
			CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion.
			CO4: Be able to use PLDs to implement the given logical problem.
14	II/II	Electrical Machines Lab –II	CO1: Assess the performance of different machines using different testing methods
			CO2: To convert the Phase from three phase to two phase and vice
			CO3: Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
			CO4: Control the active and reactive power flows in synchronous machines
			CO5: Start different machines and control the speed and power factor
15	II/II	Control Systems Lab	CO1: How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application
			CO2: Apply various time domain and frequency domain techniques to assess the system performance
			CO3: Apply various control strategies to different applications (example: Power systems, electrical drives etc)
			CO4: Test system controllability and observability using state space representation and applications of state space representation to various systems
16	III/I	Power Electronics	CO1: Understand the differences between signal level and power level devices.
			CO2: Analyze controlled rectifier circuits.



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			CO3: Analyze the operation of DC-DC choppers.
			CO4: Analyze the operation of voltage source inverters.
17	III/I	Power System –II	CO1: Analyze transmission line performance.
			CO2: Apply load compensation techniques to control reactive power
			CO3: Understand the application of per unit quantities
			CO4: Design over voltage protection and insulation coordination
			CO5: Determine the fault currents for symmetrical and unbalanced fault
18	III/I	Measurement s And Instrumentation	CO1: Understand different types of measuring instruments, their construction, operation and characteristics
			CO2: Identify the instruments suitable for typical measurements
			CO3: Apply the knowledge about transducers and instrument transformers to use them effectively.
			CO4: Apply the knowledge of smart and digital metering for industrial applications
19	III/I	High Voltage Engineering	CO1: Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials
			CO2: Knowledge of generation and measurement of D.C, A.C, & Impulse voltages.
			CO3: Knowledge of tests on H. V. equipment and on insulating materials, as per the standards.
			CO4: Knowledge of how over-voltages arise in a power system, and protection against these over-voltages.
20	III/I	Business Economics And Financial Analysis	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: Students can study the firm's financial position
			CO4: by analyzing the Financial Statements of a Company.

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21	III/I	Power System Simulation Lab	CO1: Perform various transmission line calculations
			CO2: Understand Different circuits time constants
			CO3: Analyze the experimental data and draw the conclusions.
22	III/I	Power Electronics Lab	CO1: Understand the operating principles of various power electronic converters.
			CO2: Use power electronic simulation packages & hardware to develop the power converters.
			CO3: Analyze and choose the appropriate converters for various applications
23	III/II	Disaster Preparedness & Planning Management	CO1: the application of Disaster Concepts to Management
			CO2: Analyzing Relationship between Development and Disasters
			CO3: Ability to understand Categories of Disasters
			CO4: Realization of the responsibilities to society.
24	III/II	Power Semiconductor Drives	CO1: Identify the drawbacks of speed control of motor by conventional methods.
			CO2: Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics merits and demerits
			CO3: Understand Ac motor drive speed-torque characteristics using different control strategies its merits and demerits
			CO4: Describe Slip power recovery schemes
25	III/II	Signals & Systems	CO1: Differentiate various signal functions.
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems
			CO4: Analyze the signals with different transform technique
26	III/II	Microproce	CO1: Understands the internal architecture, organization and assembly language programming of 8086 processors.

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		Processors & Microcontrollers	<p>CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers</p> <p>CO3: Understands the interfacing techniques to 8086 and 8051 based systems.</p> <p>CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.</p>
27	III/II	Power System Protection	<p>CO1: Compare and contrast electromagnetic, static and microprocessor-based relays</p> <p>CO2: Apply technology to protect power system components</p> <p>CO3: Select relay settings of over current and distance relays.</p> <p>CO4: Analyze quenching mechanisms used in air, oil and vacuum circuit breakers</p>
28	III/II	Power System Lab	<p>CO1: Perform various load flow techniques</p> <p>CO2: Understand Different protection methods</p> <p>CO3: Analyze the experimental data and draw the conclusions.</p>
29	III/II	Microprocessors & Microcontrollers Lab	<p>CO1: Assembly Language Programs to 8086 to Perform 1. Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.</p> <p>CO2: Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations.</p> <p>CO3: Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions</p> <p>CO4: Time delay Generation Using Timers of 8051</p> <p>CO5: Serial Communication from / to 8051 to / from I/O devices</p>
	III/II	Signals and	<p>CO1: Understand the concepts of continuous time and discrete time systems.</p>



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30		Systems lab	CO2: Analyse systems in complex frequency domain
			CO3: Understand sampling theorem and its implications.
31	IV/I	Artificial Intelligence	CO1: To learn the distinction between optimal reasoning Vs. human like reasoning
			CO2: To understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
			CO3: To learn different knowledge representation techniques.
			CO4: To understand the applications of AI, namely game playing, theorem proving, and machine learning.
32	IV/I	Digital Signal Processing	CO1: Understand the LTI system characteristics and Multirate signal processing
			CO2: Understand the inter-relationship between DFT and various transforms.
			CO3: Design a digital filter for a given specification
			CO4: Understand the significance of various filter structures and effects of round off errors
33	IV/I	Hvdc Transmission	CO1: Compare EHV AC and HVDC system and to describe various types of DC links
			CO2: Analyze Graetz circuit for rectifier and inverter mode of operation
			CO3: Describe various methods for the control of HVDC systems and to perform power flow analysis in AC/DC systems
			CO4: Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters
34	IV/I	Fundamentals Of Management For Engineers	CO1: The students understand the significance of Management in their Profession
			CO2: various Management Functions like Planning, Organizing, Staffing, Leading, Motivation
			CO3: Control aspects are learnt in this course.
			CO4: The students can explore the Management Practices in their domain area.
35	IV/I	Electrical & Electronics Design Lab	CO1: Get practical knowledge related to electrical
			CO2: Fabricate basic electrical circuit elements/networks

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			<p>CO3: Trouble shoot the electrical circuits</p> <p>CO4: Get hardware skills such as soldering, winding etc.</p>
36	IV/II	Non- Conventional Sources Of Energy	<p>CO1: Identify renewable energy sources and their utilization. Understand the basic concepts of solar radiation and analyze the working of solar and thermal systems.</p>
			<p>CO2: Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas and hydrogen</p>
			<p>CO3: Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator.</p>
			<p>CO4: Identify methods of energy storage for specific applications</p>
37	IV/II	Power Quality & Facts	<p>CO1: Know the severity of power quality problems in distribution system</p>
			<p>CO2: Understand the concept of voltage sag transformation from up-stream (higher voltages) to down-stream (lower voltage)</p>
			<p>CO3: Concept of improving the power quality to sensitive load by various mitigating custom power devices</p>
			<p>CO4: Choose proper controller for the specific application based on system requirements</p>
			<p>CO5: Understand various systems thoroughly and their requirements</p>
			<p>CO6: Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz. Transient stability Enhancement, voltage instability prevention and power oscillation damping</p>
			<p>CO7: Understand the Power and control circuits of Series Controllers GCSC, TSSC and TCSC</p>
38	IV/II	Electrical Distribution Systems	<p>CO1: distinguish between transmission, and distribution line and design the feeders</p>
			<p>CO2: compute power loss and voltage drop of the feeders</p>
			<p>CO3: design protection of distribution systems</p>
			<p>CO4: understand the importance of voltage control and power factor improvement</p>



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MECHANICAL ENGINEERING I and II Course Outcomes for the Academic Year 2022-2023

S.NO	YEAR /SEM	COURSE NAME	COURSE OUTCOMES
1	II/I	Metallurgy and Material science	CO1: Identify the properties of metals with respect to crystal structure and grain size
			CO2: Interpret the phase diagrams of materials
			CO3: Classify and Distinguish different types of cast irons, steels and non ferrous alloys
			CO4: Describe the concept of heat treatment of steels & strengthening mechanisms
			CO5: Explain the powder metallurgy process, types and manufacturing of composite materials
2	II/I	Mechanics Of Solids	CO1: Understand the concepts of stress and strain and evaluate
			CO2: Apply the concept of shear force and bending moment for simple structural problems
			CO3: Apply the concepts of principal stresses and strains , body subjected to direct stresses accompanied by shear stresses
			CO4: Evaluate bending stresses and shear stresses for simple structures
			CO5: Analyze thin cylinders subjected to various stresses
			CO6: Evaluate stresses in shafts.
3	II/I	Thermo-Dynamics	CO1: Understand and differentiate between different thermodynamic system and process
			CO2: Understand and apply the laws of thermodynamics to different types of systems.
			CO3: Undergoing various processes and to perform thermodynamic analysis.
			CO4: Understand and analyze the thermodynamic cycle.
			CO5: Understand and evaluate performance parameters.



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			CO6: Develop the concept of power cycle with description and representation on p-v and T-S diagram
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4	II/I	Production Technology	CO1: Elaborate the fundamentals of various moulding casting techniques and furnaces.
			CO2: Identify the importance of permanent joining and principle behind different welding processes
			CO3: Explain the concepts of solid-state welding processes
			CO4: Understand the concepts of rolling and sheet metal operations in metal working.
			CO5: Elaborates the uniqueness of extrusion, forging and high energy rate forming processes in metal working.
			CO6: Develop process-maps for metal forming process using plasticity principles and identify the effect of process variable to manufacturing defect free products.
5	II/I	Machine Drawing Practice	CO1: Preparation of engineering and working drawings with dimensions and bill of material during design and development. Developing assembly drawings using part drawings of machine components
			CO2: Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs.
			CO3: Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned.
			CO4: Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers, curved and tapered features.
			CO5: Title boxes, their size, location and details - common abbreviations and their liberal usage.
			CO6: Types of Drawings – working drawings for machine parts.
6	II/I	Probability And Statistics & Complex Variable	CO1: Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.
			CO2: analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
			CO3: Taylor's and Laurent's series expansions of complex function
			CO4: Evaluate the integrals using Cauchy's integral formula and residue theorems.

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			CO5: Solve the problems involving random variables.
7	III/I	Dynamics Of Machinery	CO1: Apply the knowledge of the gyroscopic effect and evaluate the stability of Ship, Aero plane, Two wheeler and Four wheeler.
			CO2: Understand the concept of Equilibrium of a body subjected to static and dynamic forces
			CO3: Analyze the concept of fluctuation energy, inertia of connecting rod- inertia force in reciprocating engines
			CO4: Develop the ability to identify a problem and apply the fundamental concepts of transmission and concepts of friction
			CO5: Understand the significance of governors and balancing of masses in various machines where ever applicable
			CO6: Develop the ability to function on multi-disciplinary teams by having knowledge of vibrations
8	III/I	Thermal Engineering - II	CO1: Develop state – space diagrams based on the schematic diagrams of process flow of steam and gas turbine plants
			CO2: Apply the laws of Thermodynamics to analyze thermodynamic cycles
			CO3: Differentiate between vapour power cycles and gas power cycles
			CO4: Infer from property charts and tables and to apply the data for the evaluation of performance parameters of the steam and gas turbine plants
			CO5: Understand the functionality of major components of steam and gas turbine plants and to do the analysis of these components
9	III/I	Design Of Machine Members-I	CO1: The student acquires the knowledge about the principles of design, material selection, component behavior subjected to loads, design on the basis of strength & rigidity, and analyze the stresses & strains induced in a machine element
			CO2: Understands the concepts of principal stresses, Failure theories and design of components subjected to various static loads
			CO3: Student can able to design the machine components subjected to various varying & reversal loadings considering stress concentration in machine members
			CO4: Students will able to design the joints such as Bolted, Welded and Riveted Joints used in industrial Applications
			CO5: Students can design various keys used in Power Transmission Applications and also they can able to design various Cotter and Knuckle Joints
			CO6: Students can able to design the shafts and their components



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			Industrial Power Transmission Applications
10	III/I	Metrology And Machine Tools	CO1: Identify techniques to minimize the errors in measurement.
			CO2: Identify methods and devices for measurement of length, angle, gear & thread parameters, surface roughness and geometric features of parts.
			CO3: Understand working of lathe, shaper, planar, drilling, milling and grinding machines.
			CO4: Comprehend speed and feed mechanisms of machine tools
			CO5: Estimate machining times for machining operations on machine tools
11	III/I	Business economics and Financial analysis	CO1: Understand the elasticity of the demand of the product, different types, and measurement of elasticity of demand and factors influencing on elasticity of demand.
			CO2: Recognize the Production function, features of Iso-Quants and Iso-Costs, different types of internal economies, external economies and law of returns with appropriate examples.
			CO3: Illustrate the features, merits and demerits of different forms of business organizations existing in the modern business.
			CO4: Enumerate the concept of capital budgeting and allocations of the resources through capital budgeting methods and compute simple problems for project management.
			CO5: Evaluate different types of financial ratios for knowing liquidity and profitability positions of business concern.
12	III/I	Operations Research	CO1: Identify and develop operational research models from the verbal description of the real system.
			CO2: Understand the mathematical tools that are needed to solve optimisation problems.
			CO3: Use mathematical software to solve the proposed models.
			CO4: Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.
			CO5: Linear programming: solving methods, duality, and sensitivity analysis.
13	IV/I	Power Plant Engineering	CO1: Able to get the basics of Power Plants.
			CO2: Able to get the idea about the power generation by renewable and non-renewable energy resources.
			CO3: Able to know about the different types of cycles and natural resources used in power plants and their applications.
			CO4: Evaluate the performance of condensers and steam turbines
			CO5: Evaluate the performance of gas turbines

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14	IV/I	Refrigeration and Air conditioning	CO1: Analyze the reversed Carnot cycle and vapor compression refrigeration cycle (VCR).
			CO2: Select the air-refrigeration systems for aircraft, and vapor absorption refrigeration system for rural and remote areas and select environmental friendly refrigerants considering the international standards.
			CO3: Identify the Psychometric processes for different applications and design the parameters of air-conditioning system as per standards.
			CO4: Understand the human comfort, ASHRAE chart and concept of effective temperature
			CO5: Estimate cooling load and heating load considering human comfort and optimize the air conditioning system as per requirements.
15	IV/I	Mems	CO1: Students will be able to understand working principles of currently available micro sensors, actuators, and motors, valves, pumps, and fluidics used in Microsystems.
			CO2: Students will be able to apply scaling laws that are used extensively in the conceptual design of micro devices and systems. Students will be able to differentiate between the positive and negative consequences of scaling down certain physical quantities that are pertinent to Microsystems.
			CO3: Students will be able to use materials for common micro components and devices.
			CO4: Students will be able to choose a micromachining technique, such as bulk micromachining and surface micromachining for a specific MEMS fabrication process.
			CO5: Students will be able to consider recent advancements in the field of MEMS and devices
			CO6: Students will be able to communicate their results and findings orally via formal presentations and in writing through reports.
16	IV/I	Fluid Power System	CO1: Understand the Properties of fluids, Fluids for hydraulic systems,
			CO2: governing laws. distribution of fluid power, Design and analysis of typical hydraulic circuits
			CO3: Know accessories used in fluid power system, Filtration systems
			CO4: maintenance of system.
			CO5: Under Stand the maintenance of the pneumatic system.
17	IV/I	Utilization Of Electrical Energy	CO1: Understand basic principles of electric heating and welding.
			CO2: Determine the lighting requirements for flood lighting, household and industrial needs.
			CO3: Calculate heat developed in induction furnace.
			CO4: Evaluate speed time curves for traction
			CO5: To understand the concepts of electric drives and their application to electrical traction systems.
18	II/II	Kinematics Of	CO1: Understand the various elements in mechanism and the inversions of



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		Machinery	<p>commonly used mechanisms such as four bar, slider crank and double slider crank mechanisms</p> <p>CO2: Draw the velocity and acceleration polygons for a given configuration of a mechanism.</p> <p>CO3: Mechanical Engineering we come across number of mechanisms such as four bar/slider crank/double slider crank/straight line motion mechanism etc.</p> <p>CO4: Once we make a study considering for us also there it is called kinetics. The first course deals with mechanisms, their inversions straight line motion mechanisms steering mechanisms etc.</p> <p>CO5: Also study of cams/gears & gear trains & belts are also introduced.</p> <p>CO6: The main purpose is to give an idea about the relative motions obtained in all the above type of components used in mechanical Engineering.</p>
19	II/II	Fluid mechanics And Hydraulic machines	<p>CO1: Able to explain the effect of fluid properties on a flow system.</p> <p>CO2: Able to identify type of fluid flow patterns and describe continuity equation.</p> <p>CO3: To analyze a variety of practical fluid flow and measuring devices and utilize Fluid Mechanics principles in design.</p> <p>CO4: To select and analyze an appropriate turbine with reference to given situation in power plants</p> <p>CO5: To estimate performance parameters of a given Centrifugal and Reciprocating pump.</p> <p>CO6: To estimate performance parameters of a given Centrifugal and Reciprocating pump.</p>
20	II/II	Instrumentation and Control systems	<p>CO1: To identify various elements and their purpose in typical instruments, to identify various errors that would occur in instruments</p> <p>CO2: Analysis of errors so as to determine correction factors for each instrument.</p> <p>CO3: To understand static and dynamic characteristics of instrument and should be able to determine loading response time.</p> <p>CO4: For given range of displacement should be able to specify transducer, its accurate and loading time of that transducer.</p> <p>CO5: Identifying properties used for evaluating the thermal systems.</p> <p>CO6: Identifying errors and their types that would occur in an instrument.</p>
21	II/II	Thermal Engineering –I	<p>CO1: the student should be able to evaluate the performance of IC engines and compressors under the given operating conditions</p> <p>CO2: Apply the laws of Thermodynamics to evaluate the performance of Refrigeration and air-conditioning cycles</p> <p>CO3: Understand the functionality of the major components of the IC Engines and effects of operating conditions on their performance</p>



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			CO4: The functionality of the major components of the IC engine
			CO5: evaluate the perform analysis of the major components and systems of IC engines, refrigeration cycles and their applications.
22	II/II	Basic Electrical And Electronics Engineering	CO1: To analyze and solve electrical circuits using network laws and theorems
			CO2: To understand and analyze basic Electric and Magnetic circuits
			CO3: To study the working principles of Electrical Machines
			CO4: To introduce components of Low Voltage Electrical Installations
			CO5: To identify and characterize diodes and various types of transistors.
23	III/II	CAD & CAM	CO1: Understand geometric transformation techniques in CAD
			CO2: Develop mathematical models to represent curves and surfaces. Model engineering components using solid modeling techniques.
			CO3: Develop programs for CNC to manufacture industrial components
			CO4: To understand the application of computers in various aspects of Manufacturing.
			CO5: Design, Proper planning, Manufacturing cost, Layout & Material Handling system.
24	III/II	Heat Transfer	CO1: Understand the basic modes of heat transfer
			CO2: Compute one dimensional steady state heat transfer with and without heat generation
			CO3: Understand and analyze heat transfer through extended surfaces
			CO4: Interpret and analyze forced and free convective heat transfer
			CO5: Understand the principles of boiling, condensation and radiation heat transfer
			CO6: Design of heat exchangers using LMTD and NTU methods



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25	III/II	Unconventional Machining Processes	CO1: Understand the basic techniques of Unconventional Machining processes modeling
			CO2: To teach the modeling technique for machining processes
			CO3: To teach the mechanics and thermal issues associated with chip formation
			CO4: To teach the effects of tool geometry on machining force components and surface finish
			CO5: To teach the machining surface finish and material removal rate
			CO6: Estimate the material removal rate and cutting force, in an industrially useful manner, for Unconventional Machining processes.
26	III/II	Finite Element Methods	CO1: At the end of the course, the student will be able to, Apply finite element method to solve problems in solid mechanics, fluid mechanics and heat transfer.
			CO2: Formulate and solve problems in one dimensional structures including trusses, beams and frames.
			CO3: Formulate FE characteristic equations for two dimensional elements and analyze plain stress, plain strain, axisymmetric and plate bending problems. ANSYS, ABAQUS, NASTRAN, etc.
			CO4: Implementation of material model in finite element method and applications
			CO5: Importance of interfaces and joints on the behavior of engineering systems
27	III/II	Design Of Machine Members- II	CO1: Ability to use Standard Design Data Book and knowledge about journal bearing design
			CO2: Estimation of life of rolling element bearings and their selection for given service conditions
			CO3: Knowledge of design of Internal Combustion Engine Components
			CO4: Student can able to design different belt drives, pulleys & various springs used in industrial and Automobile Applications
			CO5: Ability to design Spur gears used in Industrial & Automotive Applications
			CO6: Knowledge of design of Helical gears used in Industrial & Automotive Applications
28	III/II	Disaster Management	CO1: To Understand basic concepts in Disaster Management
			CO2: To Understand Definitions and Terminologies used in Disaster Management
			CO3: To Understand Types and Categories of Disasters.
			CO4: To Understand the Challenges posed by Disasters.


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			CO5: To understand Impacts of Disasters Key Skills.
29	IV/II	Basic Power Plant Engineering	CO1: To understand Basic Rankine cycle and its modifications, layout of modern coal power plant, super critical boilers
			CO2: To understand FBC boilers, turbines, condensers, steam and heating rates, subsystems of thermal power plants, fuel and ash handling, draught system, feed water treatment, binary cycles and cogeneration systems
			CO3: Explain Brayton cycle analysis and optimization, components of gas turbine power plants, combined cycle power plants, Integrated Gasifier based Combined Cycle (IGCC) systems.
			CO4: Layout and subsystems of nuclear power plants, Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANDU Reactor, Pressurized Heavy Water Reactor (PHWR), Fast Breeder Reactors (FBR), gas cooled and liquid metal cooled reactors, safety measures for nuclear power plants.
			CO5: To understand Power tariffs, load distribution parameters, load curve, capital and operating cost of different power plants, pollution control technologies including waste disposal options for coal and nuclear plants.



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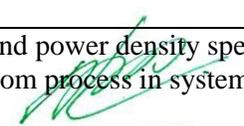
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ELECTRONICS AND COMMUNICATION AND ENGINEERING I & II SEM COURSE OUTCOMES FOR THE ACADEMIC YEAR: 2022-2023

S.NO.	YEAR /SEM	COURSE NAME	Course Outcomes
1	II/I	Electronics Devices & Circuits	CO1: Analyze the applications of the p-n diode as rectifier and Zener diode as voltage regulator
			CO2: Analyze the characteristics of BJT in CB, CE and CC configurations
			CO3: Design and analyze the transistor biasing circuits for a given operating point
			CO4: Design and analyze amplifiers at low frequencies using h parameter model
			CO5: Analyze FET and MOSFET amplifiers at low frequencies
2	II/I	Digital System Design.	CO1: Understand the numerical information in different forms and Boolean Algebra theorems.
			CO2: Understand Postulates of Boolean algebra and to minimize combinational functions.
			CO3: Design and Analyze combinational and sequential circuits.
			CO4: Know about the logic families and realization of logic gates.
3	II/I	Network Analysis & Transmission Theory	CO1: Gain the knowledge on basic RLC circuits behavior
			CO2: Analyze the Steady state and transient analysis of RLC Circuits.
			CO3: Know the characteristics of two port network parameters
			CO4: Analyze the transmission line parameters and configurations
4	II/I	Probability Theory and Stochastic Process	CO1: Understand probabilities and able to solve using an appropriate sample space
			CO2: Compute various operations like expectations from probability density functions (pdfs) and probability distribution functions
			CO3: Perform Likelihood ratio tests from pdfs for statistical engineering Problems
			CO4: : Mean and covariance functions for simple random variables
			CO5: Understand Auto-correlation and cross correlation properties between two random variables
			CO6: Explain the concept of random process, differentiate between stochastic and ergodic processes
			CO7: Explain the concept of power spectral density and power density spectrum of a random process. 8. Apply the principles of a random process in system concepts.


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5	II/I	Signals and Systems	CO1: Defining the various signals and identifying the signal functions & relations
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems.
			CO4: Analyze the signals with different transform technique
6	II/I	Electronics Devices & Circuits Lab	CO1: Analyze the characteristics of p-n junction diode and Zener diode and calculate the dynamic and static resistance in forward bias and reverse bias respectively
			CO2: Calculate the ripple factor and efficiency of Half Wave and Full wave rectifiers with and without filters.
			CO3: Analyze the characteristics of BJT in Common Emitter and Common Base configurations and calculate the corresponding h-parameters
			CO4: Analyze the characteristics of FET in Common Source configuration and calculate the gm and rd.
			CO5: Calculate Bandwidth of BJT/FET amplifier from its frequency response. Obtain the characteristics of UJT and SC
7	II/I	Digital System Design Lab	CO1: Implement Boolean Expressions using universal logic gates .
			CO2: Design and verify Combinational logic circuits using IC's .
			CO3: Design and verify Sequential logic circuits using IC's
			CO4: Implement Counters & Shift registers using FF's
8	II/I	Basic Simulation Lab	CO1: Synthesize a given waveform using standard test signals and sequences.
			CO2: Analyze the effect of various transformations applied on independent and dependent variables of a signal.
			CO3: Determine the symmetry (even/odd) of signals /sequences.
			CO4: Classify a system based on its characteristics and find its response for various excitations.


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			CO5: Convert time domain signal into frequency domain using Fourier transform and plot its magnitude and phase spectrum.
9	II/II	Laplace Transforms, Numerical Methods & Complex Variables	CO1: understand the Laplace transforms techniques for solving ode's
			CO2: find the root of a given equation.
			CO3: calculate the value for the given data using interpolation
			CO4: analyze the numerical solutions for a given ode's
			CO5: analyze the complex function with reference to their analyticity, integration using cauchy's integral and residue theorems.
10	II/II	Electromagnetic Fields and Waves	CO1: Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magnetostatic Fields.
			CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
			CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
			CO4: To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems
11	II/II	Analog and Digital Communications	CO1: Analyze and design of various continuous wave and angle modulation and demodulation techniques
			CO2: Understand the effect of noise present in continuous wave and angle modulation techniques.
			CO3: Attain the knowledge about AM, FM Transmitters and Receivers
			CO4: Analyze and design the various Pulse Modulation Techniques.
			CO5: Understand the concepts of Digital Modulation Techniques and Baseband transmission
12	II/II	Linear IC Applications	CO1: Understand the internal operation of Op-Amp and its specifications.
			CO2: Analyze and design linear applications like adder, subtractor, instrumentation amplifier and etc. using Op-Amp.
			CO3: Analyze and design nonlinear applications like multiplier, comparator and etc, using Op-Amp.

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			<p>CO4: Attain the knowledge of functional diagrams and applications of IC 555 and IC565 and applications</p> <p>CO5: Acquire the knowledge about the Data converters.</p>
13	II/II	Electronic Circuit Analysis	<p>CO1: Analyze single stage amplifiers at Mid-band, Low frequency and High frequency regions</p>
			<p>CO2: Analyze multistage amplifiers at Mid-band, Low frequency and High frequency regions.</p>
			<p>CO3: Design and analyze different types of feedback amplifiers and oscillators using transistors</p>
			<p>CO4: Analyze different types of power amplifiers and compare them in terms of efficiency.</p>
			<p>CO5: Analyze tuned amplifiers and the effects of cascading tuned amplifiers</p>
14	II/II	Analog and Digital Communications.	<p>CO1:Analyze the spectrum of various analog modulation techniques</p>
			<p>CO2:Design a multiplexing system using FDM</p>
			<p>CO3:Examine various pulse modulation techniques</p>
			<p>CO4: Analyze different digital modulation and demodulation</p>
15	II/II.	IC Applications Lab	<p>CO1:Design analog circuits for practical applications using Op Amp IC-741</p>
			<p>CO2: Design waveform generators and PLL circuits using ICs</p>
			<p>CO3: Design multi vibrators using IC555 and Schmitt trigger using IC741</p>
			<p>CO4: Analyze the practical applications of Voltage Regulator using various ICs.</p>
	II/II	Electronic Circuits Analysis Lab	<p>CO1:Design, simulate and verify basic amplifier circuits</p>
			<p>CO2:Design, simulate and verify feedback amplifiers and oscillators.</p>

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16			CO3: Design, simulate and verify power amplifier circuits
			CO4: Design, simulate and verify Multivibrators and Sweep Circuits.
17	II/II	Gender Sensitization Lab	CO1: Develop a better understanding of important issues related to gender in contemporary India.
			CO2: Analyze basic dimensions of the biological, sociological, psychological and legal aspects of gender.
			CO3: Develop a sense of appreciation of women in all walks of life and will be equipped to work and live together as equals.
			CO4: Examine the new laws for women protection & relief, and empower students to understand and respond to gender violence
18	III/I	Microprocessors & Microcontrollers	CO1: Understands the internal architecture, organization and assembly language programming of 8086 processors.
			CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers
			CO3: Understands the interfacing techniques to 8086 and 8051 based systems.
			CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
19	III/I	Data Communications and Networks	CO1: Analyze the Categories and functions of various Data communication Networks
			CO2: Design and analyze various error detection techniques
			CO3: Demonstrate the mechanism of routing the data in network layer
			CO4: Analyze the significance of various Flow control and Congestion control Mechanisms
			CO5: Analyze the Functioning of various Application layer Protocols.
			CO6: Analyze the features and operations of various user interface protocols.
20	III/I	Control Systems	CO1: Explain different ways of system representations such as Transfer function
			CO2: Apply various time domain and frequency domain techniques to assess the system performance
			CO3: Apply various control strategies to different applications like power

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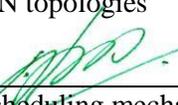
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			systems, electrical drives etc
			CO4: Design various controllers and compensators to improve system performance
			CO5: Construct the State models for continuous & discrete time systems and comment on controllability and Observability of the system
			CO6: Compute the transfer function of system by different techniques.
21	III/I	Business Economics & Financial Analysis	CO1: Understand the various forms of business CO2: contrast of demand and supply CO3: change production, cost market structures and pricing CO4: study the firm's financial position CO5: Relate to analyze the financial statements of a company
22	III/I	Electronic Measurements and Instrumentation	CO1: Identify the various electronic instruments based on their specifications for carrying out a particular task of measurement. CO2: Measure various physical parameters by appropriately selecting the transducers. CO3: Use various types of signal generators, signal analyzers for generating and analyzing Various real-time signals. CO4: Explain functioning, specification and applications of signal generators, signal analyzers for generating and analyzing various real-time signals.
23	III/I	Microprocessors & Microcontrollers Lab	CO1: Write programs in assembly language using the instruction set of 8086 through MASM software as well as using 8086 Kit. CO2: Interface different I/O devices with 8086 and establish communication between them. CO3: Write programs in assembly language using instruction set of 8051 and execute the same. CO4: Verify the operations of the timer, counter and serial port (UART) of 8051.
24	III/I	Data Communications and Networks	CO1: Create and evaluate the performance of various LAN topologies CO2: Evaluate the performance of queue management, scheduling mechanisms


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		Lab	and protocols
			CO3: Evaluate the performance of routing protocols and IEEE 802.x standards
			CO4: Analyze various protocols using packet capture monitoring tools.
25	III/I	Advanced Communication Skills Lab	CO1: Build sound vocabulary and use functional English effectively
			CO2: Analyze the given text and respond appropriately and develop efficacious writing skills
			CO3: Develop effective speaking skills and maximize job prospects
			CO4: Plan and make different forms of presentation using various techniques.
26	III/II	Antennas and Wave Propagation	CO1: Explain radiation mechanism and various parameters of an antenna.
			CO2: Design Loop, Helical, Horn and Yagi–Uda antennas.
			CO3: Explain the working principle of Microstrip, Reflector and Lens antennas.
			CO4: . Design different types of arrays and explain the test procedures involved in Antenna Measurements.
			CO5: Explain the mechanisms of wave propagation and atmospheric effects on radio wave propagation
27	III/II	Digital Signal Processing	CO1: Understand the LTI system characteristics and Multirate signal processing
			CO2: Understand the inter-relationship between DFT and various transforms
			CO3: Design a digital filter for a given specification.
			CO4: Understand the significance of various filter structures and effects of round off errors
28	III/II	VLSI Design	CO1: Explain MOS technology of NMOS, PMOS, CMOS and BiCMOS.
			CO2: Design stick diagrams and draw the layout of a logic circuit
			CO3: Analyze the architectural issues involved in subsystem design.
			CO4: . Design building blocks of data path subsystems and analyze simple memories using MOS transistors.
			CO5: Apply concepts of VLSI design methodology and explain the test-principles
29	III/II	Embedded	CO1: To understand the selection procedure of Processors in the embedded



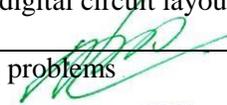
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		System Design	domain
			CO2: Design Procedure for Embedded Firmware.
			CO3: To visualize the role of Real time Operating Systems in Embedded Systems.
			CO4: To evaluate the Correlation between task synchronization and latency issues.
30	III/II	Disaster Preparedness planning Management	CO1: Explain disaster management theory (cycle, phases, risk, crisis, emergency, disasters, resilience
			CO2: Compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disast
			CO3:: Compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster
			CO4: Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction
			CO5: Evaluate DM study including data search, analysis and presentation as a case study.
			CO6: Create Technological innovations in Disaster Risk Reduction: Advantages and problems
31	III/II	Digital Signal Processing	CO1: Generate sinusoidal and noise waveforms using different approaches
			CO2: Analyze Impulse and frequency response of various digital filters.
			CO3: Verify different algorithms of DSP through simulation
			CO4: Implement various DSP algorithms in hardware.
32	III/II	e-CAD Lab	CO1: Verify the functionality of digital circuits using Xilinx ISIM simulator
			CO2: Implement digital circuits on various FPGA boards using Xilinx tools
			CO3: Design layout for digital circuits and perform physical verification
			CO4: Analyze static timing, IR drop and crosstalk in digital circuit layouts
	III/II		CO1: Design and test programs to solve mathematical problems


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33		Scripting Languages Lab	CO2: Develop programs Using Ruby Script
			CO3: Develop Programs Using TCL Script
			CO4: Develop Programs Using Perl Script
34	IV/I	Microwave and Optical Communications	CO1: Analyze various modes of microwave transmission lines.
			CO2: Examine various waveguide components and their applications.
			CO3: Analyze the characteristics of O-type and M-type microwave tubes
			CO4: Estimate S-parameters of multiport junction devices
			CO5: Measure various parameters using microwave bench
35	IV/I	Professional Practice, Law & Ethics	CO1: understand the importance of professional practice and Law Ethics
			CO2: Define the law of contract and its key elements of valid contract
			CO3: judge arbitration and conciliation and alternative Dispute resolution
			CO4: role play the labor and construction related laws
			CO5: Explain the students rights and Responsibility as an Employee
36	IV/I	Network Security and Cryptography	CO1: Describe network security fundamental concepts and principles
			CO2: Encrypt and decrypt messages using block ciphers and network security technology and protocols
			CO3: Analyze key agreement algorithms to identify their weaknesses
			CO4: Identify and assess different types of threats, malware, spyware, viruses, vulnerability
37	IV/I	Digital Image Processing	CO1: Remember Upon completing this course, the student will be able to Explore the fundamental relations between pixels

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			CO2: Understand utility of 2-D transforms in image
			CO3: Apply processor the enhancement, segmentation
			CO4: Analyze restoration processes on an image.
			CO5: Evaluate Implement the various Morphological operations on an image
			CO6: Create the need of compression and evaluation of basic compression algorithms.
38	IV/I	Artificial Intelligent	CO1: Ability to formulate an efficient problem space for a problem expressed in natural language.
			CO2: Select a search algorithm for a problem and estimate its time and space complexities.
			CO3: Possess the skill for representing knowledge using the appropriate technique for a given problem
			CO4: Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.
39	IV/I	Microwave and Optical Communications lab	CO1: Analyze the characteristics of microwave sources and devices.
			CO2: Measure different parameters of various microwave devices.
			CO3: Measure the Scattering Parameters of various Tee Junctions
40	IV/I	Seminar	CO1: Identify emerging topic specific to the programmer
			CO2: Extract the information relevant to the chosen topic.
			CO3: Deliver the knowledge using multimedia
			CO4: Answer the queries with appropriate explanation and elaboration.

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Abdullapur (V), Abdullapurmet (M), R.R Dist, 501505, Telangana, INDIA.

Email : principal@knrcer.ac.in ; website: www.knrcer.ac.in

41	IV/1	Project Stage - I	CO1: Identify problem, conduct relevant literature survey and formalize it.
			CO2: Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools (if necessary) and processes
			CO3: Implement the design and demonstrate the functionality of developed model
			CO4: Evaluate the results to derive the conclusion and provide scope for future enhancement.
42	IV/11	Radar Systems	CO1: Analyze the performance of Radar system and its parameters
			CO2: Analyze the functionality of CW and FMCW radar
			CO3: Classify the mechanism of detecting stationary and moving targets
			CO4: Compare the working mechanism of various tracking radars.
			CO5: Analyze the radar signals in noisy environment.
			CO6: Assess various components and parameters of Radar Receivers
43	IV/11	System on Chip Architecture.	CO1: Remember SOC Architectural features.
			CO2: Understand to acquire the knowledge on processor selection criteria and limitations
			CO3: Apply to acquire the knowledge on processor selection limitations
			CO4: Analyze to acquire the knowledge of memory architectures on SOC.
			CO5: Evaluate to the interconnection strategies on SOC.
			CO6: Create to the interconnection strategies customization on SOC.
44	IV/11	Database Management Systems	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques.
45	IV/11	Project	CO1: Identify problem, conduct relevant literature survey and formalize it.

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		Stage – II	CO2: Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools (if necessary) and processes
			CO3: Implement the design and demonstrate the functionality of developed model
			CO4: Evaluate the results to derive the conclusion and provide scope for future enhancement.



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Computer Science and Engineering I & II Sem Course Outcomes For The Academic Year 2022-2023

S.NO.	YEAR/SEM	COURSE NAME	Course Outcomes
1	II/I	Data Structures	CO1: Ability to select the data structures that efficiently model the information in a problem.
			CO2: Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			CO3: Implement and know the application of algorithms for sorting and pattern matching.
			CO4: Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees
2	II/I	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1: Understand the basics of instructions sets and their impact on processor design
			CO2: Demonstrate an understanding of the design of the functional units of a digital computer system
			CO3: Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			CO4: Design a pipeline for consistent execution of instructions with minimum hazards.
			CO5: Recognize and manipulate representations of numbers stored in digital computers.
3	II/I	OBJECT ORIENTED PROGRAMMING USING C++	CO1: Able to develop programs with reusability
			CO2: Develop programs for file handling
			CO3: Handle exceptions in programming
			CO4: Develop applications for a range of problems using object-oriented programming techniques
		ANALOG	CO1: Know the characteristics of various components
			CO2: Understand the utilization of components
			CO3: Design and analyze small signal amplifier circuits.



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4	II/I	AND DIGITAL ELECTRO NICS	CO4: Learn Postulates of Boolean algebra and to minimize combinational functions
			CO5: Design and analyze combinational and sequential circuits
			CO6: Know about the logic families and realization of logic gates.
5	II/I	COMPUTE R ORIENTE D STATISTI CAL METHODS	CO1: Apply the concepts of probability and distributions to some case studies
			CO2: Correlate the material of one unit to the material in other units
			CO3: Resolve the potential misconceptions and hazards in each topic of study
			CO4: To measure experimental result based on hypothesis using chi square techniques
6	II/I	ANALOG AND DIGITAL ELECTRO NICS	Co1: Know the characteristics of various components.
			CO2: Understand the utilization of components.
			CO3: Design and analyze small signal amplifier circuits
			CO4: Postulates of Boolean algebra and to minimize combinational functions
			CO5: Design and analyze combinational and sequential circuits
7	II/I	Data Structure Lab	CO1: Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
			CO2: Ability to Implement searching and sorting algorithms
8	II/I	C++ LAB	CO1: Ability to develop applications for a range of problems using object-oriented programming techniques
9	II/I	Gender Sensitizatio n Lab	CO1: To develop students' sensibility with regard to issues of gender in contemporary India.
			CO2: To provide a critical perspective on the socialization of men and women.
			CO3: To introduce students to information about some key biological aspects of genders.
			CO4: To expose the students to debates on the politics and economics of work.

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			<p>CO5: To help students reflect critically on gender violence</p> <p>CO6: To expose students to more egalitarian interactions between men and women</p>
10	III/I	COMPUTER NETWORKS	<p>CO1: Gain the knowledge of the basic computer network technology</p> <p>CO2: Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model</p> <p>CO3: Obtain the skills of sub netting and routing mechanisms</p> <p>CO4: Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.</p>
11	III/I	Software Engineering	<p>CO1: Ability to translate end-user requirements into system and software requirements, using e.g.UML, and structure the requirements in a Software Requirements Document (SRD).</p> <p>CO2: Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.</p> <p>CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report</p>
12	III/I	WEB TECHNOLOGIES	<p>CO1: gain knowledge of client-side scripting, validation of forms and AJAX programming</p> <p>CO2: understand server-side scripting with PHP language</p> <p>CO3: understand what is XML and how to parse and use XML Data with Java</p> <p>CO4: To introduce Server-side programming with Java Servlets and JSP</p>
13	III/I	PRINCIPLES OF PROGRAMMING LANGUAGES	<p>CO1: Acquire the skills for expressing syntax and semantics in formal notation</p> <p>CO2: Identify and apply a suitable programming paradigm for a given computing application</p> <p>CO3: Gain knowledge of and able to compare the features of various programming languages</p> <p>CO4: Combine the constructs of programming structures with efficiently using oops, concurrency management and event handling</p> <p>CO5: Demonstrate the working of functional and logic programming language</p>

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14	III/I	Formal languages & Automate theory	CO1: Able to understand the concept of abstract machines and their power to recognize the languages
			CO2: Able to employ finite state machines for modeling and solving computing problems
			CO3: Able to design context free grammars for formal languages
			CO4: Able to distinguish between decidability and undecidability.
			CO5: Able to gain proficiency with mathematical tools and formal methods.
15	III/I	INFORMATION RETRIEVAL SYSTEMS	CO1: Ability to apply IR principles to locate relevant information large collections of data
			CO2: Ability to design different document clustering algorithms
			CO3: Implement retrieval systems for web search tasks.
			CO4: Design an Information Retrieval System for web search tasks
16	III/I	SOFTWARE ENGINEERING LAB	CO1: Ability to translate end-user requirements into system and software requirements
			CO2: Ability to generate a high-level design of the system from the software requirements
			CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
17	III/I	CN&WT LAB	CO1: Implement data link layer framing methods
			CO2: Analyze error detection and error correction codes
			CO3: Implement and analyze routing and congestion issues in network design.
			CO4: Implement Encoding and Decoding techniques used in presentation layer
			CO5: To be able to work with different network tools
18	IV/I	DATA MINING	CO1: Ability to understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
			CO2: Apply preprocessing methods for any given raw data.
			CO3: Extract interesting patterns from large amounts of data.
			CO4: Discover the role played by data mining in various fields
			CO5: Choose and employ suitable data mining algorithms to build analytical applications

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			CO6: Evaluate the accuracy of supervised and unsupervised models and algorithms
19	IV-1	CLOUD COMPUTING	CO1: Ability to understand various service delivery models of a cloud computing architecture
			CO2: Ability to understand the ways in which the cloud can be programmed and deployed.
			CO3: Understanding cloud service providers.
20	IV-I	SOFTWARE PROCESS & PROJECT MANAGEMENT	CO1: Gain knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation
			CO2: Analyze the major and minor milestones, artifacts and metrics from management and technical perspective
			CO3: Design and develop software product using conventional and modern principles of software project management
21	IV-I	PRINCIPLES OF PROGRAMMING LANGUAGES	CO1: Acquire the skills for expressing syntax and semantics in formal notation
			CO2: Identify and apply a suitable programming paradigm for a given computing application
			CO3: Gain knowledge of and able to compare the features of various programming languages
22	IV/I	PYTHON PROGRAMMING	CO1: Examine python syntax and semantics and be fluent in the use of python basic types and functions.
			CO2: Demonstrate proficiency in handling Exceptions, modules and Files.
			CO3: Create, run and manipulate Python Multithreading programs and use Regular Expressions.
			CO4: Implement GUI Applications related to Web Services in Python.
			CO5: Develop exemplary applications related to Databases.



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23	IV/I	INDUSTRY ORIENTED MINI PROJECT	CO1: Student will able to learn about mini project
24	II/II	DISCRETE MATHEMATICS	CO1: Ability to understand and construct precise mathematical proofs
			CO2: Ability to use logic and set theory to formulate precise statements
			CO3: Ability to analyze and solve counting problems on finite and discrete structures
			CO4: Ability to describe and manipulate sequences
			CO5: Ability to apply graph theory in solving computing problems
25	II/II	OPERATING SYSTEMS	CO1: Will be able to control access to a computer and the files that may be shared
			CO2: Demonstrate the knowledge of the components of computer and their respective roles in computing.
			CO3: Ability to recognize and resolve user problems with standard operating environments
			CO5: Understanding file system structure and directory structure.
26	II/II	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.
27	II/II	DATABASE MANAGEMENT SYSTEMS	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data.
			CO3: Be acquainted with the basics of transaction processing and concurrency control.

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			CO4: Familiarity with database storage structures and access techniques
28	II/II	JAVA PROGRAMMING	CO1: Able to solve real world problems using OOP techniques
			CO2: Able to understand the use of abstract classes.
			CO3: Able to solve problems using java collection framework and I/o classes.
			CO4: Able to develop multithreaded applications with synchronization.
			CO5: Able to develop applets for web applications.
			CO6: Able to design GUI based applications
29	II/II	OS LAB	CO1: Simulate and implement operating system concepts
			CO2: Able to implement C programs using Unix system calls
30	II/II	DBMS LAB	CO1: Design database schema for a given application and apply normalization
			CO2: Acquire skills in using SQL commands for data definition and data manipulation.
			CO3: Develop solutions for database applications using procedures, cursors and triggers
31	II/II	JAVA LAB	CO1: Able to write programs for solving real world problems using java collection framework
			CO2: Able to write programs using abstract classes.
			CO3: Able to write multithreaded programs
			CO4: Able to write GUI programs using swing controls in Java.
32	III/II	CONSTITUTION OF INDIA	CO1: Able to understand the concept of abstract machines and GUI based applications.
			CO2: Able to employ finite state machines for modeling and solving computing problems.
			CO3: Able to design context free grammars for formal languages.
			CO4: Able to distinguish between decidability and undecidability.
			CO5: Able to gain proficiency with mathematical tools and formal methods.
			CO1: Demonstrate the ability to design a compiler given a set of language features.
			CO2: Demonstrate the the knowledge of patterns, tokens & regular expressions for lexical analysis.

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33	III/II	COMPILE R DESIGN	CO3: Acquire skills in using lex tool & yacc tool for developing a scanner and parser.
			CO4: Design and implement LL and LR parsers
			CO5: Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity
			CO6: Design algorithms to generate machine code.
34	III/II	MACHINE LEARNIN G	CO1: Understand the concepts of computational intelligence like machine learning
			CO2: Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
			CO3: Understand the Neural Networks and its usage in machine learning application.

35	III/II	DESIGN AND ANALYSIS OF ALGORITHM S	CO1: Analyze algorithms and improve the efficiency of algorithm for the divide and conquer method.
			CO2: Ability to analyze the performance of algorithms
			CO3: Ability to choose appropriate data structures and algorithm design methods for a specified application
			CO4: Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
36	III/II	SOFTWARE TESTING METHODOLOGIES	CO1: Ability to apply the process of testing and various methodologies in testing for developed software.
			CO2: Ability to write test cases for given software to test it before delivery to the customer.

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37	III/II	ML LAB	CO1: understand complexity of Machine Learning algorithms and their limitations;
			CO2: understand modern notions in data analysis-oriented computing;
			CO3: be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
			CO4: Be capable of performing experiments in Machine Learning using real-world data.
38	III/II	CD LAB	CO1: Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML
			CO2: Apply client-server principles to develop scalable and enterprise web applications.
			CO3: Ability to design, develop, and implement a compiler for any language.
			CO4: Able to use lex and yacc tools for developing a scanner and a parser.
			CO5: Able to design and implement LL and LR parsers.
39	III/II	ES LAB	CO1: : Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
40	IV/II	ORGANIZATIONAL BEHAVIOUR	CO1: Analysis the behavior of individuals and groups in organizations in terms of the key factors that influence organizational behavior.
			CO2: Access the potential effects of organizational level factors on organizational behavior
			CO3: Critically evaluate the potential effects of important developments in the external environment on organizational behavior.
			CO4: Analyse organizational behavior issues in the context of organizational behavior theories, models and concepts.
41	IV/II	REAL TIME SYSTEMS	CO1: Be able to explain real-time concepts such as preemptive multitasking, task priorities, priority inversions, mutual exclusion, context switching, and synchronization, interrupt latency and response time, and semaphores.
			CO2: Able describe how a real-time operating system kernel is implemented.
			CO3: Able explain how tasks are managed.
			CO4: Explain how the real-time operating system implements time management.

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			CO5: Discuss how tasks can communicate using semaphores, mailboxes, and queues.
			CO6: Be able to implement a real-time system on an embedded processor.
			CO7: Be able to work with real time operating systems like RT Linux, Vx Works, MicroC /OSII, TinyOs.
42	IV/II	Web Services and Service Oriented Architecture	CO1: Basic details of WSDL, UDDI, SOAP
			CO2: Implement WS client and server with interoperable systems.
43	IV/II	PROJECT WORK	CO1: Student will be able to analyze a problem, identify and define the computing requirements appropriate to its solutions.
			CO2: Students will be able to function effectively on teams to accomplish a common goal.
			CO3: Students will be able to use current techniques, skill and tools necessary for computing practices.
			CO4: Students will be able to design and development principles in the construction of software systems of varying complexity.
			CO5: Students will be able to get an eye opener to bridge gap between Academic and real time industry issues on technological front

CSM I & II Sem Course Outcomes For The Academic Year 2022-2023

S.NO.	YEAR /SEM	COURSE NAME	Course Outcomes
1	III/I	Discrete Mathematics	CO1: Ability to understand and construct precise mathematical proofs.
			CO2: Ability to use logic and set theory to formulate precise statements
			CO3: Ability to analyze and solve counting problems on finite and discrete structures
			CO4: Ability to describe and manipulate sequences

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			CO5: Ability to apply graph theory in solving computing problems
2	II/I	DATA STRUCTURES	CO1: Ability to select the data structures that efficiently model the information in a problem.
			CO2: Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			CO3: Implement and know the application of algorithms for sorting and pattern matching.
			CO4: Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
3	II/I	MATHEMATICAL AND STATISTICAL FOUNDATIONS	CO1: Apply the number theory concepts to cryptography domain
			CO2: Apply the concepts of probability and distributions to some case studies
			CO3: Correlate the material of one unit to the material in other units
			CO4: Resolve the potential misconceptions and hazards in each topic of study.
4	II/I	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1: Understand the basics of instructions sets and their impact on processor design.
			CO2: Demonstrate an understanding of the design of the functional units of a digital computer system
			CO3: Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			CO4: Design a pipeline for consistent execution of instructions with minimum hazards.
			CO5: Recognize and manipulate representations of numbers stored in digital computers
5	II/I	PYTHON PROGRAMMING	CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
			CO2: Demonstrate proficiency in handling Strings and File Systems
			CO3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
			CO4: Interpret the concepts of Object-Oriented Programming as used in Python.
			CO5: Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
			CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business.

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6	II/I	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.
7	II/I	DATA STRUCTURE SLAB	CO1: Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
8	II/II	FORMAL LANGUAGES AND AUTOMATA THEORY	CO1: Able to understand the concept of abstract machines and their power to recognize the languages
			CO2: Able to employ finite state machines for modeling and solving computing problems.
			CO3: Able to design context free grammars for formal languages
			CO4: Able to distinguish between decidability and undecidability.
9	II/II	SOFTWARE ENGINEERING	CO1: Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
			CO2: Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
			CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
10	II/II	OPERATING SYSTEMS	CO1: Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
			CO2: Introduce the issues to be considered in the design and development of operating system
			CO3: Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix
11	II/II	DATABASE MANAGEMENT SYSTEMS	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data.
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques

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12	II/II	OBJECT ORIENTED PROGRAMMING USING JAVA	CO1: Able to solve real world problems using OOP techniques.
			CO2: Able to understand the use of abstract classes
			CO3: Able to solve problems using java collection framework and I/o classes.
			CO4: Able to develop multithreaded applications with synchronization.
			CO5: Able to develop applets for web applications
			CO6: Able to design GUI based applications
13	II/II	OBJECT ORIENTED PROGRAMMING USING JAVA	CO1: Able to solve real world problems using OOP techniques.
			CO2: Able to understand the use of abstract classes
			CO3: Able to solve problems using java collection framework and I/o classes.
			CO4: Able to develop multithreaded applications with synchronization.
			CO5: Able to develop applets for web applications
			CO6: Able to design GUI based applications
14	II/II	DBMS LAB	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data.
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
15	II/II	JAVA LAB	CO1: Able to write programs for solving real world problems using java collection frame work
			CO2: Able to write programs using abstract classes.
			CO3: Able to write multithreaded programs
			CO4: Able to write GUI programs using swing controls in Java.
16	II/II	OS LAB	CO1: Simulate and implement operating system concepts s
			CO2: Able to implement C programs using Unix system calls

CSD I & II Sem Course Outcomes For The Academic Year 2022-2023

S.NO.	YEAR/SEM	COURSE NAME	Course Outcomes
			CO1: Ability to understand and construct precise mathematical proofs.

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1	II/I	Discrete Mathematics	CO2: Ability to use logic and set theory to formulate precise statements
			CO3: Ability to analyze and solve counting problems on finite and discrete structures
			CO4: Ability to describe and manipulate sequences
			CO5: Ability to apply graph theory in solving computing problems
2	II/I	DATA STRUCTURES	CO1: Ability to select the data structures that efficiently model the information in a problem.
			CO2: Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			CO3: Implement and know the application of algorithms for sorting and pattern matching.
			CO4: Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
3	II/I	MATHEMATICAL AND STATISTICAL FOUNDATIONS	CO1: Apply the number theory concepts to cryptography domain
			CO2: Apply the concepts of probability and distributions to some case studies
			CO3: Correlate the material of one unit to the material in other units
			CO4: Resolve the potential misconceptions and hazards in each topic of study.
4	II/I	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1: Understand the basics of instructions sets and their impact on processor design.
			CO2: Demonstrate an understanding of the design of the functional units of a digital computer system
			CO3: Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			CO4: Design a pipeline for consistent execution of instructions with minimum hazards.
			CO5: Recognize and manipulate representations of numbers stored in digital computers
5	II/I	PYTHON PROGRAMMING	CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
			CO2: Demonstrate proficiency in handling Strings and File Systems
			CO3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.

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			<p>CO4: Interpret the concepts of Object-Oriented Programming as used in Python.</p> <p>CO5: Implement exemplary applications related to Network Programming, Web Services and Databases in Python.</p>
6	III/I	BUSINESS ECONOMIC S AND FINANCIAL ANALYSIS	<p>CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business.</p> <p>CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.</p> <p>CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.</p>
7	II/I	DATA STRUCTURES LAB	<p>CO1: Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.</p> <p>CO2: Ability to Implement searching and sorting algorithms</p>
8	II/I	PYTHON PROGRAMMING LAB	<p>CO1: Student should be able to understand the basic concepts scripting and the contributions of scripting language</p> <p>CO2: Ability to explore python especially the object-oriented concepts, and the built in objects of Python.</p> <p>CO3: Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations</p>
9	II/II	FORMAL LANGUAGES AND AUTOMATA THEORY	<p>CO1: Able to understand the concept of abstract machines and their power to recognize the languages</p> <p>CO2: Able to employ finite state machines for modeling and solving computing problems.</p> <p>CO3: Able to design context free grammars for formal languages</p> <p>CO4: Able to distinguish between decidability and undecidability.</p> <p>CO5: Able to gain proficiency with mathematical tools and formal methods.</p>
10	II/II	SOFTWARE ENGINEERING	<p>CO1: Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).</p> <p>CO2: Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.</p> <p>CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report</p>
			<p>CO1: Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)</p>


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11	II/II	OPERATING SYSTEMS	CO2: Introduce the issues to be considered in the design and development of operating system
			CO3: Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix
12	II/II	DATABASE MANAGEMENT SYSTEMS	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data.
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques
13	II/II	OBJECT ORIENTED PROGRAMMING USING JAVA	CO1: Able to solve real world problems using OOP techniques.
			CO2: Able to understand the use of abstract classes
			CO3: Able to solve problems using java collection framework and I/o classes.
			CO4: Able to develop multithreaded applications with synchronization.
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			CO3: Able to write multithreaded programs
			CO4: Able to write GUI programs using swing controls in Java.
6	II/II	OS LAB	CO1: Simulate and implement operating system concepts
			CO2: Able to implement C programs using Unix system calls

Humanity & Sciences

I & II Sem Course outcomes for the Academic year 2022-2023



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S.NO	SUBJECT CODE	SUBJECT NAME	Course Outcomes
1	MA101BS	M-I	CO1: Identify the matrix representation of a set of linear equations and to analyze the solution of the system of equations
			CO2: Calculate the Eigen values and Eigen vectors
			CO3: Analyze the nature of sequence and series.
			CO4: Evaluate the improper integrals using Beta and Gamma functions
			CO5: Solve the extreme values of functions of two or three variables with/without constraints.
2	EN105HS	English	CO1: Identify the importance of Raman Effect with technical vocabulary.
			CO2: Comprehend the importance of ancient architecture in India
			CO3: Develop interest to know the process of making Jeans.
			CO4: Examine the habits of eating in the form of essay writing
			CO5: Critically appreciate the latest technology
3	EN107HS	English Language and Communication Skills Lab	CO1: Develop their confidence while giving introduction, describing a place and giving directions.
			CO2: Use various functions of english like asking for and giving information inviting people for events/occations,and requesting people
			CO3: Narrate the past experiences and events in speaking and writin
			CO4: Express their views and opinions logically and appropriately in spoken and written format.
			CO5: Deliver logically organised speeches and present them without hesitations.
	AP20	Applied	CO1: The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.

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4	2BS	Physics	CO2: The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
			CO3: Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
			CO4: The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.
5	AP20 5BS	Applied Physics Lab	CO1: Understand the practical knowledge Energy gap of P-N junction diode:Light emitting diode.
			CO2: Determine the energy gap of a semiconductor diode.
			CO3: Understand the practical knowledge Solar Cell,Photoelectric effect,Hall effect.
			CO4: To study the Stewart – Gee’s experiment.
			CO5: TO IDENTIFY Laser ,Optical fibre characteristics.
6	PH10 2BS	Engineeri ng Physics	CO1: understand about Newtonian mechanics in different coordinates
			CO2: understanding conservation of energy and charges in harmonic oscillation
			CO3: application of wave motion in one dimension of longitudinal and transverse nature
			CO4: knowledge of light propagation in different optical devices
			CO5: application of laser and fiber optics in required areas
7	PH10 5BS	Engineeri ng Physics Lab	CO1:: understand the practical knowledge of Melde’s experiment, Torsional pendulum: & Coupled Oscillator
			CO2: understand the practical knowledge of Newton’s rings, Diffraction grating & Dispersive power
			CO3: understand the practical knowledge of LCR Circuit
			CO4: understand the practical knowledge of LASER, Optical fiber
8	CH10	Chemistry	CO1: Identify the knowledge of atomic, molecular and electronic changes,

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	2BS		band theory related to conductivity.
			CO2: Comprehend the required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments
			CO3: Develop the the required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
			CO4: Develop the knowledge of configurational and conformational analysis of molecules and reaction· mechanisms..
			CO5: Examine the paracetamol and aspirin.
9	CH10 6BS	Engineering Chemistry Lab	CO1: Determination of total hardness of water by complexometric method using EDTA?HHH
			CO2: Estimation of an HCl by Conductometric titrations .
			CO3: Verification of freundlich adsorption isotherm-adsorption of acetic acid on charcoal.
			CO4: Develop the Synthesis of Aspirin and Paracetamol.
			CO5: Examination of chloride content of water by Argentometry .
10	EE10 3ES	Basic Electrical Engineering	CO1:To analyze and solve electrical circuits using network laws and theorems in DC circuits.
			CO2:To analyze and solve electrical circuits using network laws and theorems in AC circuits
			CO3:To understand and analyze basic Electric and Magnetic circuits
			CO4:To study the working principles of Electrical Machines
			CO5:To introduce components of Low Voltage Electrical Installations


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11	EE10 8ES	Basic Electrical Engineering Lab	CO1: Get an exposure to basic electrical laws.
			CO2: Understand the response of different types of electrical circuits to different excitations.
			CO3: Understand the measurement, calculation and relation between the basic electrical parameters
			CO4: Understand the basic characteristics of transformers and electrical machines.
			CO5: Understand how to measure voltage current, power in AC circuits.
			CO6: Understand the performance characteristics of generators & motors.
			CO7: Understand torque-speed characteristics of motors
12	ME2 04ES	Engineering Graphics	CO1: understand the basic rules of engineering graphics
			CO2: construction of the conic curves, cycloide curves and scales
			CO3: understand the ortho projection of points, lines & planes
			CO4: understand the ortho projection of solides and section of solides
			CO5: understand the surface development and intersection of solides
			CO6: evaluate the iso to ortho and ortho to iso projectiones
13	ME2 03ES	Engineering Mechanics	CO1: Determine resultant of forces acting on a body and analyze equilibrium of a body subjected to a system of forces
			CO2: Study the effect of friction in static and dynamic conditions
			CO3: Find the location of centroid and calculate moment of inertia of a given section.
			CO4: Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion
			CO5: Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration

MBA Course outcomes for the Academic year



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2022-2023

PROGRA MME: MBA	DEG REE: PG	A.Y: 2021- 22	SEMESTER: I, II ,III, IV
S.No	Year/ Sem	Course Name	Course Outcomes
1	I-I	Managem ent Organizatio nal Behaviour	CO1: To understand the various attitude and personalities and perceptions and leadership and motivation and apply in organizational situations
			CO2: To evaluate the management and contribution of management thinkers
			CO3: To apply the relevance of environmental scanning ,planning and to take decisions
			CO4: To interpret the individual and interpersonal behavior process for team building and group behavior development
			CO5: To analyze the organizing and controlling
2	I-I	Business Economics	CO1: To understand and learn the basics of economic principles in business
			CO2: To illustrate determinants of supply and demand and Demand Analysis and Forecasting
			CO3: To develop production and cost estimates
			CO4: To analyze the market structure
			CO5: To develop the pricing strategies
3	I-I	Financial Accounting Analysis	CO1: To understand the basic concepts of financial accounting
			CO2: To summarize preparation of financial statement
			CO3: To develop the inventory valuation
			CO4: To analyze the accounting process
			CO5: To understand the interpretation of accounting concepts

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4	I-I	Research & Statistical Analysis	CO1: To understand and learn basics of Research, Process of Research and elements of research Proposal
			CO2: To apply the various simple and advanced statistical tools
			CO3: To analyze the features and good research design
			CO4: To apply the principals of research methodology for various projects
			CO5: To understand the time series analysis and report writing
5	I-I	Legal and Business Environment	CO1: To understand all important legal provisions pertaining to Business Laws
			CO2: To Know the business laws related to incorporating a company
			CO3: To understand all important legal regulatory frame work in India
			CO4: To analyze the Law of Contract
			CO5: To develop the negotiable instruments
6	I-I	BUSINESS ETHICS AND CORPORATE GOVERNANCE	CO1: Understands the importance of business ethics in the changing environment.
			CO2: Identify the professional ethics in various functions of organisation.
			CO3: Understands the corporate governance including corporate governance codes and committees
			CO4: Analyse the role of the board in building the competitive advantage of a company.
			CO5: Explains the corporate social responsibility as a strategy for sustainable development



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7	I-I	Business Communication Lab	CO1: To provide an overview of Prerequisites to Business Communication. .
			CO2: To provide an outline to effective Organizational Communication.
			CO3: To impart the correct practices of the strategies of Effective Business writing.
			CO4: TO Discuss the importance of ethical communication Ethics in Business Communication
			CO5: TO Evaluate and practice methods of analysis to assess the quality and reliability of a source
8	I-I	Statistical Data Analysis Lab	CO1: To understand the importance of project management
			CO2: To apply the project planning and execution and implementation
			CO3: To develop the significance of teams in projects
			CO4: To analyze the project evaluation techniques
9	I-II	Human Resource Management	CO1: Explain Nature of HRM, Scope, Functions and Objectives, HRM Policies and practices.
			CO2: Understand SHRM Model
			CO3: Design Human Resource Planning
			CO4: Implement Recruitment & Selection through different sources & tests
			CO5: Make Career Planning
10	I-II	Marketing Management	CO1: Explain New Product Development & Product Life Cycle
			CO2: Explain Factors influencing pricing decisions
			CO3: Differentiate Product Vs. Brand
			CO4: Illustrate Selecting pricing method, Selecting final price.
			CO5: Explain Wholesaling, Retailing, Franchising, Direct marketing ,Ecommerce Marketing Practices

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11	I-II	Financial Management	CO1: Explain the basic concept of financial management.
			CO2: Apply the tools from financial management this would facilitate the decision making i.e. Capital Budgeting, Ratio Analysis
			CO3: develop analytical skills this would facilitate the decision making in business situations
			CO4: Explain and use of financial analysis techniques i.e. Fund Flow, Cash Flow.
			CO5: Estimate working capital requirement of Business concern
12	I-II	QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS	CO1: Explain Importance of Decision Sciences & Role of quantitative techniques In decision making
			CO2: Solve numerical on Assignment Models including special cases in Assignment models.
			CO3: Solve numerical on Transportation Models by North West Corner method, Least Cost method, VAM method and Optimal Solution by using MODI Method
			CO4: Solve numerical on Linear Programming problems by graphical method
			CO5: Solve numerical on Markov Chains & Simulation Techniques
13	I-II	Logistics Supply Chain Management	CO1: Explain the importance, scope and functions of Operations and Supply Chain Management in Present Scenario
			CO2: Explain the term Quality and can related different dimensions of Quality affecting customer satisfaction.
			CO3: Explain different operations processes , and identify different types of process-product matrix
			CO4: Prepare a service blue print for given service providing organization
			CO5: Demonstrate the Production Planning and Control and its functions for effective and efficient operations management
14	I-II	ENTREPRENEURSHIP	CO1: understand the nature of entrepreneurship
			CO2: understand the function of the entrepreneur in the successful, commercial application of innovations
			CO3: confirm an entrepreneurial business idea
			CO4: identify personal attributes that enable best use of entrepreneurial opportunities
			CO5: understand the function of the entrepreneur in the successful

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15	I-II	Rural Marketing	CO1: understand the rural marketing Vs urban marketing
			CO2: explain the rural economy and environment
			CO3: Determine social and cultural aspects in rural india
			CO4: what kind of innovations in rural marketing
			CO5: write about the rural market mapping -corporate social responsibility
16	II-II	Strategic Investment & Financing Decisions	CO1: Understand the risk, uncertainty, risk analysis in investment decisions, risk adjusted rate of return and certainty equivalents.
			CO2: .Enumerate the investment decisions under capital constraints like capital rationing, portfolio risk and diversified projects.
			CO3: Explain the concept of multiple internal rate of return, Modified internal rate of return, pure, simple and mixed investments
			CO4: Determine the Lorie savage paradox, adjusted net present value and know the impact of inflation on capital budgeting decisions.
			CO5: Discuss the concepts of lease financing, leasing Vs. Operating risk, borrowing vs. procuring, hire purchase and installment purchase decisions
17	II-I	PRODUCT ION OPERATIONS MANAGEMENT	CO1: Gaining knowledge about managing production processes
			CO2: How to run operations effectively.
			CO3: Better understanding of modern production techniques
			CO4: Better understanding of quality management
			CO5: You will learn about practical applications of operations management to plan for the future
18	II-I	Management Information system	CO1: Acquire on job the skills, knowledge, attitudes, and perceptions along with the experience needed to constitute a professional identity.
			CO2: .Get actual supervised professional experiences.
			CO3: Get insight into the working of the real organizations
			CO4: Develop perspective about business organizations in their totality
			CO5: Explore career opportunities in their areas of interest.



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19	II-I	DATA ANALYTICS	CO1: Data will be collected around the business case after careful evaluation of the business case in a particular domain.
			CO2: A Database with the data collected in the above step will be created using SQL.
			CO3: Connect the SQL database with Tableau/ Python/ R and extracting this data into environments
			CO4: Preparation of reports based on the business objective and context
			CO5: Building the dashboard using Tableau/ Power BI
20	II-II	Risk Management & Financial Derivatives	CO1: Be able to describe standard derivative contracts, their properties and functionality
			CO2: Be able to understand and apply scientific methods for valuation of options and other derivatives, in continuous and discrete time.
			CO3: Be able to interpret and apply risk measures that are commonly used in risk management.
			CO4: Be able to reflect over and critically survey different assumptions and principles behind derivatives pricing and risk management.
			CO5: Demonstrate an understanding of pricing forwards, futures and options contracts
21	II-I	Security Analysis Portfolio Management	CO1: Explored to different avenues of investment.
			CO2: Equipped with the knowledge of security analysis.
			CO3: apply the concept of portfolio management for the better investment
			CO4: invest in less risk and more return securities
			CO5: Encourage students to apply stock and option valuation models in portfolio management
22	II-I	Financial Institutions Markets & Services	CO1: Understand the role and function of the financial system in reference to the macro economy
			CO2: .Demonstrate an awareness of the current structure and regulation of the Indian financial services sector
			CO3: Evaluate and create strategies to promote financial products and services.
			CO4: To enrich student's understanding of the fundamental concepts and working of financial service institutions
			CO5: To equip students with the knowledge and skills necessary to become employable in the financial service industry


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23	II-I	Strategic Management Accounting	CO1: Explain how management accounting information is used in strategic decision making.
			CO2: Illustrate the process of strategy formulation, communication, implementation and control within an organization.
			CO3: Explain how to integrate conventional and contemporary management accounting techniques into a strategic management accounting framework
			CO4: Solve practical and applied problems by using research papers and case study analysis
			CO5: Identify and evaluate the business strategies of contemporary organisations, based on an understanding of their internal and external environments;
24	II-I	PERFORMANCE MANAGEMENT SYSTEMS	CO1: Setting and defining goals to fulfill company objectives
			CO2: Setting the right expectations for managers and employees
			CO3: Effective communication between individuals and teams
			CO4: Determining individual training and performance plans
			CO5: Determining individual training and performance plans
25	II-I	Learning & Development	CO1: To develop an understanding of the evolution of training & development from a tactical to a strategic function
			CO2: .To provide an insight into what motivates adults to learn and the most appropriate methodologies to impart training
			CO3: To understand the concept of training audit & training evaluation
			CO4: To learn how design a training module and execute it
			CO5: To understand various strategies used by organizations to measure performance & reward for the same
26	II-I	Management of Industrial Relations	CO1: Students should able to elaborate the concept of Industrial Relations
			CO2: The students should able to illustrate the role of trade union in the industrial setup
			CO3: Students should able to outline the important causes & impact of industrial disputes.
			CO4: Students should able to elaborate Industrial Dispute settlement procedures.
			CO5: Student should be able to summarize the important provisions of Wage Legislations, in reference to Payment of Wages Act 1936, Minimum Wages Act 1948 & Payment of Bonus Act 1965



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Email : principal@knrcer.ac.in ; website: www.knrcer.ac.in

27	II-I	Digital Marketing	CO1: Develop the applications of digital marketing in the globalized market
			CO2: Explain Channels of Digital Marketing
			CO3: Identify the digital marketing plan
			CO4: create Search engine marketing
			CO5: Analyze the Online Advertising
28	II-II	Customer Relationship Management	CO1: what is the need of CRM
			CO2: Determine the building customer relations
			CO3: Review of CRM process
			CO4: write about CRM structures
			CO5: Develop the Planning and Implementation of CRM
29	II-I	Advertising and Sales Management	CO1: write about Visualization of Advertising Layout
			CO2: Identify the evaluation of advertising effectiveness
			CO3: Understand the process of sales management
			CO4: describe the sales promotion
			CO5: Evaluate the need for distribution channels and managing them.
30	II-I	Consumer Behaviour	CO1: Demonstrate how knowledge of consumer behaviour can be applied to marketing.
			CO2: Identify and explain factors which influence consumer behavior
			CO3: Relate internal dynamics such as personality, perception, learning motivation and attitude to the choices consumers make.
			CO4: Use appropriate research approaches including sampling, data collection and questionnaire design for specific marketing situations
			CO5: In a team, work effectively to prepare a research report on consumer behaviour issues within a specific context.



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31	II-I	Summer Internship	CO1: Acquire on job the skills, knowledge, attitudes, and perceptions along with the experience needed to constitute a professional identity
			CO2: Get actual supervised professional experiences
			CO3: Get insight into the working of the real organizations
			CO4: Develop perspective about business organizations in their totality
			CO5: Explore career opportunities in their areas of interest
32	II-II	International Marketing	CO1: Explain the Global Marketing Management
			CO2: Understand the concept of Environment of global markets
			CO3: Analyze Assessing Global Market Opportunities
			CO4: Developing and Implementing Global Marketing Strategies
			CO5: Select the E-Marketing channels organization & controlling of the global marketing programme
33	II-II	Strategic Management	CO1: Explain the importance, scope and concept of Strategy and Strategic Management Process
			CO2: Differentiate between Tactics, Strategies and Planning and importance of each component in Strategic Management
			CO3: Prepare Vision, Mission statements and define goals, objectives for Organization
			CO4: Identify Critical Success Factors. Key Performance Indicators and Key Result Areas for any given service sector
			CO5: Demonstrate the importance of external environmental analysis as well prepare PESTLE Analysis and ETOP model for decision making
34	II-II	International Human Resource Management	CO1: Describe the role of the HR Manager in an International context
			CO2: Describe Human Resource activities in an International Context
			CO3: List and explain the differences between domestic and international HRM
			CO4: Explain the importance of cultural sensitivity in an international assignment
			CO5: Critically appraise the impact of cultural and contextual factors in shaping human resource practices in MNCs
35	II-II	Leadership and Change Management	CO1: Can explain how the particular context of public organizations influences change management and leadership.
			CO2: Is able to apply the key concepts of this course in a systematic analysis of an organizational change process in a public organization
			CO3: Has developed the ability to stay informed about current leadership



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			developments and trends through online resources and networks
			CO4: Can describe the characteristics of central change management approaches and leadership theories
			CO5: Is able to formulate and effectively communicate a change vision in an organizational setting.
36	II-II	Talent and Knowledge Management	CO1: Evaluate the potential and appropriateness of talent development strategies, policies and methods with reference to relevant contextual factors.
			CO2: .Assess the role and influence the politics of knowledge management policy and practice in a range of contexts
			CO3: Express the nature of knowledge management alternative views of knowledge, types of knowledge and concept of location of knowledge
			CO4: Examine the purpose of developing a talent management information strategy and the role of leaders in talent management
			CO5: Express the nature of knowledge management alternative views of knowledge, types of knowledge and concept of location of knowledge
37	II-II	Services Marketing	CO1: Identify Marketing Management of companies offering Services
			CO2: describe the Characteristics of services
			CO3: understand consumer behaviour in services
			CO4: Collect align service design and standards
			CO5: Correlate the delivering service and managing services promises.
38	II-II	International Financial Management	CO1: Understand international capital and foreign exchange market
			CO2: Identify and appraise investment opportunities in the international environment.
			CO3: Identify risk relating to exchange rate fluctuations and develop strategies to deal with them
			CO4: Develop strategies to deal with other types of country risks associated with foreign operations
			CO5: Express well considered opinion on issues relating to international financial management.